REMARKS

This Application has been carefully reviewed in light of the Office Action mailed May 29, 2007. Claims 1-24 were pending in the Application. In the Office Action, Claims 1-24 were rejected. In order to expedite prosecution of this Application, Applicant amends Claims 1, 8, 9, 10, 11, 13, 17, 23, and 24. Applicant cancels Claim 7 without prejudice or disclaimer. Thus, Claims 1-6 and 8-24 remain pending in the Application. Applicant respectfully request reconsideration and favorable action in this case.

In the Office Action, the following actions were taken or matters were raised:

SPECIFICATION OBJECTIONS

The Examiner objected to the title of the invention. Applicant respectfully traverses the objection. In accordance with MPEP 606.01, Applicant respectfully submits that the title for the present application is indicative of the invention in which the claims are directed. (MPEP 606.01). For example, Claim 1 is directed towards a "method of conserving power in a computer," and the title of the invention is a "[c]omputer power conservation apparatus and method." Clearly, both the title and the claims are both related to the subject matter of "power conservation" in a "computer." Therefore, Applicant respectfully submits that the title is descriptive of the invention. Accordingly, Applicant respectfully requests that the objection be withdrawn.

SECTION 102 REJECTIONS

Claims 1, 13 and 17 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,442,652 issued to Laboy et al. (hereinafter "*Laboy*"). Claims 1-3, 13 and 17-19 were rejected under 35 USC §102(e) as being anticipated by U.S. Patent No. 7,028,196 issued to Soltis Jr. et al. (hereinafter "*Soltis*"). Applicant respectfully traverses these rejections.

Under 35 U.S.C. § 102, a claim is anticipated only if each and every element as set forth in the claim is found in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051 (Fed. Cir. 1987); M.P.E.P. § 2131. In addition, "[t]he identical invention must be shown in as complete detail as is contained in the . . . claims" and "[t]he elements must be arranged as required by the claim." *Richardson v. Suzuki Motor Co.*, 9

U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989); *In re Bond*, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990); M.P.E.P. § 2131.

Rejection under *Laboy: Claims 1, 13, and 17*

Of the rejected claims, Claims 1, 13, and 17 are independent. Claim 1 recites "configuring the computer, based on the processor load, so that a lesser amount of speculative execution is enabled when the processor is lightly loaded than is enabled when the processor is heavily loaded," "assigning a first value to a branch confidence threshold when the processor is heavily loaded," and "assigning a second value to the branch confidence threshold when the processor is lightly loaded, wherein the first value is less than the second value" (emphasis added). In the Office Action, the Examiner appears to assert that the cache memory system of *Laboy* discloses the "speculative execution" limitation recited in Claim 1. (Office Action dated May 29, 2007, page 2). Applicant respectfully disagrees. For example, *Laboy* appears to disclose a cache memory system for a satellite that is engaged or disengaged based on the load and/or activity level of a processor in the satellite. (*Laboy*, column 4, lines 48-55; column 5, lines 4-30). In *Laboy*, the cache memory system is engaged when the processor has a heavy load and the idle time for the processor is below a minimum threshold level, and disengaged when the processor has a light load and the idle time for the processor is above a maximum threshold level. (Id.). However, *Laboy* seems to disclose the engaging and disengaging use of the cache memory in *Laboy* but does not appear to disclose an amount of execution, let alone the amount of "speculative execution," in a computer "based on a processor load" as recited in Claim 1. Neither in the section cited by the examiner nor elsewhere in *Laboy* does there appear to be any disclosure or even suggestion of "speculative execution," let alone the "configur[ation of] a computer, based on the processor load, so that a lesser amount of speculative execution is enabled when the processor is lightly loaded than is enabled when the processor is heavily loaded" as recited in Claim 1 (emphasis added). Moreover, *Laboy* does not disclose or even suggest anything related to a branch confidence threshold, let alone "assigning a first value to a branch confidence threshold when the processor is heavily loaded," and "assigning a second value to the branch confidence threshold when the processor is lightly loaded, wherein the first value is less than the second value" as recited in Claim 1 (emphasis added). Accordingly, for at least these reasons, Applicant respectfully requests that the rejection of Claim 1 be withdrawn.

Claim 13 recites "means for measuring a processor load" and "means for deciding, based on the processor load, whether to enable speculative execution," means for assigning a first value to a branch confidence threshold when the processor is heavily loaded," and "means for assigning a second value to the branch confidence threshold when the processor is lightly loaded, wherein the first value is less than the second value" (emphasis added). For at least the reasons discussed above in connection with independent Claim 1, Applicant respectfully submits that Claim 13 is also patentable over *Laboy*.

Claim 17 recites "[a] computer that configures itself, based on a processor load, so that a lesser amount of speculative execution is enabled when the processor is lightly loaded than is enabled when the processor is heavily loaded, wherein the computer is further configured to assign a first value to a branch confidence threshold when the processor is heavily loaded and a second value to the branch confidence threshold when the processor is lightly loaded, and wherein the first value is less than the second value" (emphasis added). For at least the reasons discussed above in connection with independent Claim 1, Applicant respectfully submits that Claim 17 is also patentable over *Laboy*.

Therefore, Applicant respectfully submits that Claims 1, 13, and 17 are patentable over *Laboy*. Accordingly, Applicant respectfully requests that the rejection of Claims 1, 13, and 17 be withdrawn.

Rejection under *Soltis*: Claims 1-3, 13, and 17-19

Of the rejected claims, Claims 1, 13, and 17 are independent. Claim 1 recites "configuring the computer, based on the processor load, so that a lesser amount of speculative execution is enabled when the processor is lightly loaded than is enabled when the processor is heavily loaded," "assigning a first value to a branch confidence threshold when the processor is heavily loaded," and "assigning a second value to the branch confidence threshold when the processor is lightly loaded, wherein the first value is less than the second value" (emphasis added). In the Office Action, the Examiner appears to assert that the power conservation measures described in *Soltis* corresponds to the "speculative execution" limitation as recited in Claim 1. (Office Action dated May 29, 2007, page 3-4). Applicant respectfully disagrees. For example, *Soltis* appears to describe a system configured to operate at a maximum performance level (e.g., setting voltage levels to high, setting clock rates to high, increasing power supply

voltage levels, etc.) when the load on the system is on high and to operate at a conservative level (e.g., setting cache latency levels to high, reducing cache power, setting clock rates to low, etc.) when the load is low. (*Soltis*, column 5, lines 9-16 and 59-67). *Soltis* appears to manage power conservation activities by changing the power supply voltage levels and the CPU clock rates based on the system load. (*Soltis*, column 5, lines 1-66). However, nowhere in *Soltis* does there appear to be any disclosure or even suggestion of enabling a "lesser amount of speculative execution" based on the processor load as recited in Claim 1. Moreover, *Soltis* does not disclose or even suggest anything related to a branch confidence threshold, let alone "assigning a first value to a branch confidence threshold when the processor is heavily loaded," and "assigning a second value to the branch confidence threshold when the processor is lightly loaded, wherein the first value is less than the second value" as recited in Claim 1 (emphasis added). Therefore, *Soltis* does not disclose all the limitations recited in Claim 1. Accordingly, for at least these reason, Applicant respectfully requests that the rejection of Claim 1 be withdrawn.

Claim 13 recites "means for measuring a processor load" and "means for deciding, based on the processor load, whether to enable speculative execution," means for assigning a first value to a branch confidence threshold when the processor is heavily loaded," and "means for assigning a second value to the branch confidence threshold when the processor is lightly loaded, wherein the first value is less than the second value" (emphasis added). For at least the reasons discussed above in connection with independent Claim 1, Applicant respectfully submits that Claim 13 is also patentable over *Soltis*.

Claim 17 recites "[a] computer that configures itself, based on a processor load, so that a lesser amount of speculative execution is enabled when the processor is lightly loaded than is enabled when the processor is heavily loaded, wherein the computer is further configured to assign a first value to a branch confidence threshold when the processor is heavily loaded and a second value to the branch confidence threshold when the processor is lightly loaded, and wherein the first value is less than the second value" (emphasis added). For at least the reasons discussed above in connection with independent Claim 1, Applicant respectfully submits that Claim 17 is also patentable over *Soltis*.

Claims 2-3 and 18-19 depend respectively from independent Claims 1 and 17 and, therefore, are also patentable over *Soltis* at least because Claims 2-3 and 18-19 incorporate the

limitations of respective Claims 1 and 17 and also additional elements which further distinguish *Soltis*. Therefore, Applicant respectfully requests that the rejection of Claims 1-3, 13, and 17-19 be withdrawn.

SECTION 103 REJECTIONS

Claims 1, 2, 12, 13, 17 and 18 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,845,456 issued to Menezes et al. (hereinafter "*Menezes*") in view of U.S. Patent No. 5,719,800 issued to Mittal et al. (hereinafter "*Mittal*"). Claims 3-6 and 19-22 were rejected under 35 USC §103(a) as being unpatentable over *Menezes* and *Mittal* as applied to claims 1 and 17 and further in view of U.S. Patent No. 5,625,826 issued to Atkinson (hereinafter "*Atkinson*"). Claims 7-11, 15 and 16 were rejected under 35 USC §103(a) as being unpatentable over *Menezes* and *Mittal* as applied to claims 1 and 13 and further in view of U.S. Patent no. 6,820,173 issued to Bittel et al. (hereinafter "*Bittel*"). Claims 23 and 24 were rejected under 35 USC §103(a) as being unpatentable over *Menezes* in view of *Mittal* and *Bittel*. Claim 7 is cancelled without prejudice or disclaimer, and, therefore, the rejection with regards to Claim 7 is now moot. With respect to the remaining claims, Applicant respectfully traverses these rejections.

To establish a *prima facie* case of obviousness under 35 U.S.C. § 103, three basic criteria must be met: First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; second, there must be a reasonable expectation of success; and finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Vaeck*, 947 F.2d 488, (Fed. Cir. 1991); M.P.E.P. § 2143. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Appellant's disclosure. *Id.* Further, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990); M.P.E.P. § 2143.01. Additionally, not only must there be a suggestion to combine the functional or operational aspects of the combined references, but also the prior art is required to suggest both the combination of elements and the structure resulting from the combination. *Stiftung v. Renishaw PLC*, 945 F.2d 1173, 1183 (Fed. Cir. 1991). Moreover, where there is no apparent disadvantage present in a

particular prior art reference, then generally there can be no motivation to combine the teaching of another reference with the particular prior art reference. *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 (Fed. Cir. 2000).

Menezes in view of *Mittal*: Claims 1, 2, 12, 13, 17, and 18

In the Office Action, the Examiner rejected Claims 1, 2, 12, 13, 17 and 18 under 35 U.S.C. 103(a) as being unpatentable over *Menezes* in view of *Mittal*. (Office Action dated May 29, 2007, page 5). Of the rejected claims, Claims 1, 13, and 17 are independent. Claim 1 recites "assigning a first value to a branch confidence threshold when the processor is heavily loaded," and "assigning a second value to the branch confidence threshold when the processor is lightly loaded, wherein the first value is less than the second value" (emphasis added). Applicant respectfully submits that none of the references disclose, teach, or suggest at least the foregoing limitations recited in Claim 1. *Menezes* appears to disclose a power management control system which changes processor performance states to a unique voltage and frequency setting based on the processor resource utilization levels. (*Menezes*, column 4, line 39 through column 5, line 6). According to *Menezes*, if utilization levels of the processor are at a level above a high threshold, then the power manager of *Menezes* increases the performance state of the processor. (*Menezes*, column 4, lines 52-60). If the utilization levels are below a low threshold, then the power manager decreases the performance state of the processor. (*Menezes*, column 4, lines 61-66). However, nowhere in *Menezes* does there appear to be any disclose or even suggestion of a branch confidence threshold, let alone "assigning a first value to a branch confidence threshold when the processor is heavily loaded," and "assigning a second value to the branch confidence threshold when the processor is lightly loaded, wherein the first value is less than the second value" as recited in Claim 1 (emphasis added). Therefore, for at least this reason, *Menezes* does not disclose or suggest all the limitations of Claim 1.

Mittal does not cure the deficiencies of *Menezes*. *Mittal* appears to disclose a computer power conservation system which manages the "tradeoff between high-speed operation and low-power operation by throttling back performance of a functional unit." (*Mittal*, column 4, lines 19-22). The throttling down of speculative instruction fetching in *Mittal* appears to be one of the mechanisms employed by *Mittal* to reduce power used by the computer system of *Mittal*. (*Mittal*, column 11, lines 58-62). However, nowhere in *Mittal* does there appear to be any

disclose or even suggestion of a branch confidence threshold, let alone "assigning a first value to a branch confidence threshold when the processor is heavily loaded," and "assigning a second value to the branch confidence threshold when the processor is lightly loaded, wherein the first value is less than the second value" as recited in Claim 1 (emphasis added). Thus, *Mittal* does not disclose or suggest all the limitations of Claim 1. Therefore, the combination of *Menezes* and *Mittal* does not disclose or suggest all the limitations of Claim 1. Accordingly, for at least this reason, Applicant respectfully requests that the rejection of Claim 1 be withdrawn.

Regarding Claims 13 and 17, for at least the reasons discussed above in connection with independent Claim 1, Applicant respectfully submits that Claim 13 and 17 are also patentable over the references. Claims 2, 13, and 18 depend from independent Claims 1, 13, 17, and, therefore, are also patentable over the references because they incorporate the limitations of respective Claims 1, 13, and 17 and also additional elements which further distinguish the references. Therefore, Applicant respectfully requests that the rejection of Claims 1, 2, 12, 13, 17, and 18 be withdrawn.

Menezes and *Mittal* in view of *Atkinson*: Claims 3-6 and 19-22

In the Office Action, the Examiner rejected Claims 3-6 and 19-22 under 35 USC §103(a) as being unpatentable over *Menezes* and *Mittal* as applied to claims 1 and 17 and further in view of U.S. Patent No. 5,625,826 issued to Atkinson. (Office Action dated May 29, 2007, page 7). Claims 3-6 and 19-22 depend from respective independent Claim 1 and 17. As discussed above, independent Claims 1 and 17 are patentable over *Menezes* and *Mittal*. In the Office Action, the Examiner does not rely on *Atkinson* to cure, nor does *Atkinson* appear to cure, the deficiencies of *Menezes* and *Mittal*. Therefore, for at least these reasons, Claims 3-6 and 19-22 are patentable over the references, and Applicant respectfully requests that the rejection of Claims 3-6 and 19-22 be withdrawn.

Menezes and *Mittal* in view of *Bittel*: Claims 8-11, 15, and 16

In the Office Action, the Examiner rejected Claims 7-11, 15 and 16 under 35 USC §103(a) as being unpatentable over *Menezes* and *Mittal* as applied to claims 1 and 13 and further in view of *Bittel*. (Office Action dated May 29, 2007, page 7). Claim 7 is cancelled without prejudice or disclaimer, and, therefore, the rejection with regards to Claim 7 is now

moot. Claims 8-11, 15, and 16 depend from respective independent Claim 1 and 13. As discussed above, independent Claims 1 and 13 are patentable over *Menezes* and *Mittal*. *Bittel* does not cure the deficiencies of *Menezes* and *Mittal*. *Bittel* appears to disclose a system for increasing the accuracy of speculative predictions when a computer system uses a speculative requests system. (*Bittel*, column 3, lines 4-68). In *Bittel*, based on the number of times a particular branch request is actually taken or not taken, *Bittel* appears to establish a confidence threshold that the particular branch instruction will be taken. (*Bittel*, column 3, lines 38-50). *Bittel* appears to indicate that speculative requests may be issued based on the confidence threshold of the particular branch. (Id.). However, nowhere in *Bittel* does there appear to be any disclose or even suggestion of "assigning a first value to a branch confidence threshold when the processor is heavily loaded," and "assigning a second value to the branch confidence threshold when the processor is lightly loaded, wherein the first value is less than the second value" as recited in Claim 1 for example. As a matter of fact, *Bittel* appears to teach away from this limitation altogether as shown in the following excerpt of text:

> In further embodiments, the present invention may be "throttled" based on various factors. For example, the speculative requests may be selectively deferred if the total number of the processor requests exceeds a predetermined amount, or if a number of information streams exceeds a predetermined amount. Such predetermined amount may be determined based on a capacity of the hardware associated with the prefetcher module 208.

(*Bittel*, Column 8, line 62 through column 9, line 2) (emphasis added). In the cited text, *Bittel* appears to disclose that speculative requests are "deferred" or suspended if processor loads are high and exceed a predetermined amount which appears to be directly opposite to what is recited in Claim 1. Thus, the combination of *Menezes*, *Mittal*, and *Bittel* does not disclose, teach, or suggest all the limitations of Claim 1. Therefore, Claims 8-11 that depend from independent Claim 1 are patentable over the combination of *Menezes*, *Mittal*, and *Bittel*.

Claim 13 recites "means for assigning a first value to a branch confidence threshold when the processor is heavily loaded," and "means for assigning a second value to the branch confidence threshold when the processor is lightly loaded, wherein the first value is less than the second value" (emphasis added). For at least the reasons discussed above, Claims 15 and 16 that depend from independent Claim 13 are also patentable over the references.

Menezes in view of *Mittal* in view of *Bittel*: Claims 23 and 24

In the Office Action, the Examiner rejected Claims 23 and 24 under 35 USC §103(a) as being unpatentable over *Menezes* in view of *Mittal* and *Bittel*. (Office Action dated May 29, 2007, page 8). Of the rejected claims, Claim 23 is independent. Claim 23 recites "logic that computes, from the measured processor load, a branch confidence threshold, wherein the logic assigns a first value to the branch confidence threshold when a processor is heavily loaded, and wherein the logic assigns a second value to the branch confidence threshold when the processor is lightly loaded, and wherein the first value is less than the second value" (emphasis added). As discussed above, for at least the same reasons discussed above in connection with independent Claim 1, Applicant respectfully submits that Claim 23 is patentable over the combination of *Menezes* and *Mittal*. *Bittel* does not cure the deficiencies of *Menezes* and *Mittal*. *Bittel* appears to disclose a system for increasing the accuracy of speculative predictions when a computer system uses a speculative requests system. (*Bittel*, column 3, lines 4-68). In *Bittel*, based on the number of times a particular branch request is actually taken or not taken, *Bittel* appears to establish a confidence threshold that the particular branch instruction will be taken. (*Bittel*, column 3, lines 38-50). *Bittel* appears to indicate that speculative requests may be issued based on the confidence threshold of the particular branch. (Id.). However, nowhere in *Bittel* does there appear to be any disclose or even suggestion of logic that computes, from the measured processor load, a branch confidence threshold, wherein the logic assigns a first value to the branch confidence threshold when a processor is heavily loaded, and wherein the logic assigns a second value to the branch confidence threshold when the processor is lightly loaded, and wherein the first value is less than the second value" as recited in Claim 23 for example. As a matter of fact, *Bittel* appears to teach away from this limitation altogether as shown in the following excerpt of text:

> In further embodiments, the present invention may be "throttled" based on various factors. For example, the speculative requests may be selectively deferred if the total number of the processor requests exceeds a predetermined amount, or if a number of information streams exceeds a predetermined amount. Such predetermined amount may be determined based on a capacity of the hardware associated with the prefetcher module 208.

(*Bittel*, Column 8, line 62 through column 9, line 2) (emphasis added). In the cited text, *Bittel* appears to disclose that speculative requests are "deferred" or suspended if processor loads are

high and exceed a predetermined amount which appears to be directly opposite to what is recited in Claim 23. Thus, the combination of *Menezes*, *Mittal*, and *Bittel* does not disclose, teach, or suggest all the limitations of Claim 23. Therefore, Claim 23 is patentable over the combination of *Menezes*, *Mittal*, and *Bittel*.

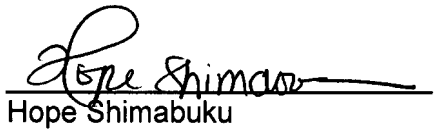
Claim 24 depends from Claim 23, and, therefore, is also patentable over the references because at least Claim 24 incorporates the limitations of Claim 23 and also have additional elements which further distinguishes the references. Therefore, Applicant respectfully requests that the rejection of Claims 23 and 24 be withdrawn.

CONCLUSION

Applicant has made an earnest attempt to place this case in condition for immediate allowance. For the foregoing reasons and for other reasons clearly apparent, Applicant respectfully requests reconsideration and full allowance of all pending claims.

No fee is believed due with this Response. If, however, Applicant has overlooked the need for any fee due with this Response, the Commissioner is hereby authorized to charge any fees or credit any overpayment associated with this Response to Deposit Account No. 08-2025 of Hewlett-Packard Company.

Respectfully submitted,

By: 
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